

Science High School Course Descriptions

New Science Graduation requirements beginning with the school year 2009-2010: Biology, Chemistry or Physics and one additional laboratory science course to meet graduation requirements for School Year 2012-2013 and beyond.

Biology I # 3210

Recommended pre-requisites: Physical Science or Physical World Concepts, Chemistry

Biology I is a *laboratory science course* that investigates the relationship between structure and function from molecules to organisms and systems, the interdependence and interactions of biotic and abiotic components of the environment, and mechanisms that maintain continuity and lead to changes in populations over time. Students explore biological concepts through an inquiry approach. Embedded standards for Inquiry, Technology & Engineering, and Mathematics are taught in the context of the content standards for Cells, Interdependence, Flow of Matter and Energy, Heredity, and Biodiversity and Change.

Biology II # 3216

Recommended pre-requisites: Biology I and Chemistry I

Biology II is a *laboratory science course* in which students engage in an in-depth study of the principles of biology. This course emphasizes internal and external anatomical structures and their functions, the environmental interaction of organisms, processes of living things, mechanisms that maintain homeostasis, biodiversity, and changes in life forms over time. Students explore biological concepts through an inquiry approach. Embedded standards for Inquiry, Technology & Engineering, and Mathematics are taught in the context of the content standards for Cells, Interdependence, Flow of Matter and Energy, Heredity, Biodiversity and Change, Comparative Anatomy and Physiology, and Botany.

Chemistry I # 3221

Recommended pre-requisites: Physical science, Algebra I

Chemistry I is a *laboratory science course* in which students investigate the composition of matter and the physical and chemical changes it undergoes. Students use science process skills to study the fundamental structure of atoms, the way atoms combine to form compounds, and the interactions between matter and energy. Students explore chemistry concepts through an inquiry-based approach. Embedded standards for Inquiry, Mathematics, and Technology & Engineering are taught in the context of the content standards for Atomic Structure, Matter and Energy, and Interactions of Matter.

Chemistry II # 3224

Recommended pre-requisites: Chemistry I, Algebra II

Chemistry II is a *laboratory science course* that builds on topics introduced in Chemistry I. This course investigates chemical bonding and how the kinetic molecular theory and intermolecular forces explain the physical and chemical characteristics of matter. Additional aspects of chemical reactions including limiting reactants, percent yield, equilibrium, reaction rates, and thermochemistry are considered. Students explore chemistry concepts through an inquiry-based approach. Embedded standards for Inquiry, Mathematics, and Technology & Engineering are taught in the context of the content standards for Structure of Matter, States of Matter, and Reactions.

Courses without pre-requisites are generally ninth grade options. For all science course options see High School Sequence chart on the Science page at <http://www.tnelc.org/>

Curriculum standards for all science courses can be viewed at <http://tn.gov/education/curriculum.shtml>

Earth Science # 3204

Earth Science is a *laboratory science course* that explores origins and the connections between the physical, chemical, and biological processes of the earth system. Students experience the content of Earth Science through inquiry-based laboratory investigations and focus on topics associated with matter, energy, crystal dynamics, cosmic evolution, and structure, cycles, geochemical processes, and the expanded time scales needed to understand events in the earth system. Earth Science provides the knowledge, skills, and habits of mind needed for problem solving and ethical decision making about scientific and technological issues. Embedded standards for Inquiry and Technology & Engineering are taught in the context of the content standards for the Universe, Energy in the Earth System, Cycles in the Earth System, and Geologic History.

Ecology # 3255

Recommended pre-requisites: Physical Science or Environmental Science; Biology, Chemistry

Ecology is a *laboratory science course* that enables students to develop an understanding of the natural and man-made environment and the environmental problems the world faces. Students explore ecological concepts through an inquiry approach. Embedded standards for Inquiry and Technology & Engineering are taught in the context of the content standards for Individuals, Populations, Communities, Ecosystems, Biomes, Humans and Sustainability.

Environmental Science # 3260

Environmental Science is a *laboratory science course* that enables students to develop an understanding of natural and man-made environments and environmental problems the world faces. Students explore environmental science concepts through an inquiry-based approach. Embedded standards for Inquiry and Technology & Engineering are taught in the context of the content standards for Earth Systems, The Living World, Human Population, Water and Land Resources, Energy Resources and Consumption, Pollution and Waste Production, Global Change, and Civic Responsibility.

Geology # 3205

Recommended pre-requisites: Earth Science or Physical Science; Biology, Chemistry

Geology is a *laboratory science course* that explores the origins and the connections between the physical, chemical, and biological processes that govern the earth system. Students explore the physical aspects of earth processes and cycles through open-ended field and laboratory investigations. Understanding the importance of these processes and how they influence humankind enables students to make sound decisions about both their community and the earth's global environment. Embedded standards for Inquiry and Technology & Engineering are taught in the context of the content standards for Maps, Matter and Minerals, Rocks and the Rock Cycle, Geologic History, Plate Tectonics, and Landforms.

Human Anatomy and Physiology # 3251

Recommended pre-requisites: Biology I and Chemistry I

Human Anatomy and Physiology is a *laboratory science course* that includes of an in-depth study of the body systems that maintain homeostasis from anatomical, physiological, and histological perspectives. Students explore anatomical and physiological concepts through an inquiry-based approach. Embedded standards for Inquiry and Technology & Engineering are taught in the context of the content standards for Anatomical Orientation, Protection, Support, and Movement, Integration and Regulation, Transportation, Absorption and Excretion, and Reproduction, Growth, and Development.

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Physical Science # 3202

Recommended co-requisite: Algebra I

Physical Science is a *laboratory science course* that explores the relationship between matter and energy. Students investigate physical science concepts through an inquiry-based approach. Embedded standards for Inquiry, Technology & Engineering, and Mathematics are taught in the context of the content standards for Energy, Matter, Motion, and Forces.

Physical World Concepts # 3237

Recommended co-requisite: Algebra I

Conceptual Physics is a *laboratory science course* that examines the interactions between matter and energy. Students explore physics concepts through an inquiry-based approach. Embedded standards for Inquiry, Technology & Engineering, and Mathematics are taught in the context of the content standards for Mechanics, Thermodynamics, Waves and Optic, Electricity and Magnetism, and Nuclear Science.

Physics # 3231

Recommended pre-requisites: Physical Science, Physical World Concepts; Algebra II or Pre-Calculus

Physics is a *laboratory science course* that examines the relationship between matter and energy and how they interact. This course will have a strong emphasis in the mathematics of physics. Students explore physics concepts through an inquiry approach. Embedded standards for Inquiry, Technology & Engineering, and Mathematics are taught in the context of the content standards for Mechanics, Thermodynamics, Waves and Sound, Light and Optics, Electricity and Magnetism and Atomic & Nuclear Science.

Scientific Research # 3295

Recommended pre-requisites: Biology, Chemistry, Physics

Scientific Research is a *laboratory science course* that enables students to both apply and expand previous science content knowledge toward the endeavor of engaging in open-ended, student-centered investigations that are designed to answer testable questions. Embedded standards for Technology & Engineering are taught in the context of the content standards that enable students to: Practice Ethics, Think Critically, Investigate, Analyze and Evaluate Data, and Communicate Results.

Career Technology Education

The following courses may be used to meet science requirements.

Note: Instructors must hold the proper science endorsement, have Highly Qualified status, and attend the five day state sponsored training workshop to teach this course. For more information contact the [Office of Career and Technical Education](#).

Agriscience # 5121

Biology for Technology # 3210 (2)

Principles of Technology I # 3220

Principles of Technology II # 3256

Recommended pre-requisite: Principles of Technology I

Note: Students must take both Principles of Technology I and Principles of Technology II to receive a credit in Physics.

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Nutrition Science # 5615, # 5616

5615 is used if the FACS teacher holds both a FACS and Biology or Chemistry endorsement.

5616 is used if the FACS teacher is team teaching with a Biology or Chemistry instructor.

Anatomy and Physiology # 5509

Recommended pre-requisites: Biology, Chemistry as pre or co-requisite.

Advanced Placement Courses:

Descriptions for AP courses can be found at the [College Board website](#):

Biology # 3217

Recommended pre-requisites: Biology I and Chemistry I

Chemistry # 3225

Recommended pre-requisites: Chemistry I, Chemistry II

Physics B #3233

Recommended pre-requisite: Physics, Algebra II or Pre-Calculus

Physics C # 3234

Recommended pre-requisite: Physics, co-requisite: Calculus

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